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The Concept of Instinct

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Instinct is one of the oldest conceptions of traditional psychology. There seemed to be such a halo of sacredness and majesty about it, only a few years ago, that nobody ever thought of questioning its credentials either as a fact or as a principle of explanation. In ancient times and in mediæval ages the magic word to lay all doubts at rest was instinct. In modern times too, instinct is almost invariably referred to as the ultimate explanation of whatever may befall mankind or happen in history. With Bergson, as with Mr. Bernard Shaw, the solution of the riddle of life is instinct. Religion, society, art, all owe their origin to instinct. It is conflict among groups of instincts which is responsible for all the woes of the lunatic and the worries of the neurotic. It is because of the instinct of workmanship that industry flourishes. The instinct of competition is at the base of all economic activities of the world. And, I shall not be surprised to hear it argued in favour of democracy that it is the only legitimate form of government, for it satisfies the instinct to vote which is present in every man. To judge from the extensive use of the term, one can legitimately expect that it has a well defined meaning. But as a matter of fact, the frequent application of the concept has merely served to make it more and more ambiguous. I shall try in the following pages to indicate the variety of meanings attributed to the term in different times and different contexts.

With the theologians instinct, as opposed to reason, was primarily a phenomenon of animal behaviour. Every type of behaviour is to be explained by an instinct implanted in them by the benevolent Creator. Indeed this solution of the problem merely reflected the attitude which prevailed in the Middle Ages and which left its impress on every field of thought and activity of the time. As is well known, it hindered not only studies of animal responses but also the advent of scientific psychology and even the progress of such universally recognised sciences as physics, chemistry, astronomy, etc. Evidences of a revival of this attitude and a recrudescence of such ideas are discernible here and there in the literary and other activities even of the present generation, as when the doctrine of evolution becomes tabooed from the curriculum of some universities and a prelate pleads for the suspension of all scientific studies for ten years.

The dominance of this school of thought prevented any analytical studies of instincts which were generally supposed to have very little influence on human affairs. This opinion prevailed till the middle of the 19th century when Darwin began to publish his new interpretations of the valuable facts collected by him during his memorable voyage. With the publication of the *Origin of Species*, there was a complete change in the angle of vision regarding the problem of animal behaviour. The idea of evolution found definite expression, when Spencer wrote "Mind can be understood only by observing how mind is evolved." "*Si, la psychologie humaine est légitime,*" as Claparède later reiterated, "*la psychologie comparée l'est aussi, pour les mêmes raisons.*" One effect of the spread of this view was to direct the attention of science to a deeper analysis of the fundamental concepts in the light of facts patiently collected by numerous observers. Instinct was one of the concepts which received early attention of the scientists. At the initial stage the issue was generally confined to the question of types of behaviour which could be

subsumed under the term instinct. A more fundamental question, however, has latterly been raised. The issue is no longer what the province of instinct is but whether there is any such thing called instinct. It is evident, however, that the two alternatives cover much of common ground in as much as people trying to determine the province of instinct must necessarily form some ideas about the nature of an instinct and it is exactly an analysis of these ideas about instinct that forms the task of those who doubt the utility of retaining the concept in psychology. It is logical enough too that the former question should occur earlier in the history of psychology than the latter. It would be best therefore to follow the historical course in our treatment of the subject.

The notable advance that Darwin and Wallace made was to show that the forms of human and animal behaviour exhibit striking analogies. From this they proceeded to the conclusion that both forms of reaction had a common origin and were qualitatively continuous. And with regard to the problem of instinct their chief contribution was, first to deny that instincts were stereotyped as the theologians supposed, and secondly to deny that instinct was a phenomenon of animal life only. The influence of Darwin and of his method of work led other investigators to base their knowledge of animal instinct on actual first-hand observations with the consequence that within a short time masses of facts were collected bearing testimony to the variability of instincts rather than to their invariability. In this enthusiasm for facts theoretical discussions about the nature of instinct was put a little in the shade, till we come to another great personality, James. James admits that animals often act in such a way as to produce certain ends, without foresight of the ends and without previous education in the performance. But instead of defining these admirably definite tendencies to action by giving abstract names to the purpose they serve, as is the usual custom, he pleads for a strictly physiological way of interpreting

them. About the nature of instinct he makes two definite assertions, namely, that "The actions we call instinctive all conform to the general reflex type" and that "Every instinct is an impulse"—a *Tribe*—as Schneider and other German writers designate it.¹ The term impulse need not signify any special form of psychic energy. In another connection he states expressly, that "Reflex, instinctive and emotional movements are all primary performances. The nerve centres are so organised that certain stimuli pull the trigger of certain explosive parts; and a creature going through one of these explosions for the first time undergoes an entirely novel experience."² Instinct then is only one form of reaction of sensory stimuli based on inherited nervous constitution. It is not invariable and is subject to modification by habits so that one impulse may be inhibited by another.

This line of thought, however, is not novel in as much as Herbert Spencer had propounded a similar theory at an earlier date. He too sought for a physiological basis of instinct. He defined instinct as a compound reflex, meaning thereby a series of reflexes in which the effect of the previous action served as the stimulus for the succeeding one.

In the meantime comparative psychology was making rapid progress and facts were being observed with regard to animal behaviour which paid but scant homage to theological doctrines. But conservatism dies hard and the attempt to reconcile the old theoretical presuppositions and the newly discovered facts resulted in a hopelessly loose usage of the term instinct.

From this time on every discussion on the nature of instinct begins with a reference to the extreme looseness with which the term is used and ends with an attempt to settle once

¹ James, *Principles*, Vol. II, Ch. XXIV.

² *Ibid.* Ch. XXVI.

for all which of these various meanings ought to be the proper one.

While James on the whole emphasises the psychological aspects of instinctive behaviour McDougall is inclined to pay special stress on its psychical counterpart. There is every reason to believe that even the most purely instinctive action is the outcome of a distinctly mental process, one which is incapable of being described in purely mechanical terms, because it is a psychophysical process, involving psychical as well as physical changes, and one which, like every other mental process, has, and can only be fully described in terms of, the three aspects of all mental process—the cognitive, the affective and the conative aspects.¹ He defines instinct as “an inherited or innate psychophysical disposition which determines its possessor to perceive, and to pay attention to, objects of a certain class, to experience an emotional excitement of a particular quality upon perceiving such an object, and to act in regard to it in a particular manner, or at least, to experience an impulse to such action.”²

Stout also in a Symposium on Instinct and Intelligence emphasises the psychical aspect of instinctive behaviour. According to him, instinct is a reaction in response to a meaning-consciousness.³ The behaviour serves to fulfil the meaning. Unless we assume such a meaning-consciousness, we cannot explain the origination of any type of complicated response, nor its repetition. For, unless the grain means food the chick would not peck ; unless water means swimming the duckling would not swim. In the same way, the pleasure-pain principle is a meaning. That is why the burnt child dreads the flame. The meaning, however, need not be explicit. It is a form of implicit awareness.

Lloyd Morgan, however, does not find himself in

¹ McDougall, *Social Psy.*, 17th Edn., Ch. II, p. 26.

² McDougall, *ibid.*, p. 29.

³ Br. J. of Psy., Vol. III, 1910.

agreement with Stout and McDougall in regard to this point. He urges that the instinctive act originates as a reflex but gathers a meaning unto it by way of back stroke. Thus, the first performance of the chick or of the duckling is meaningless. But every subsequent performance becomes rich with meaning.¹

Myers in the same symposium identifies instinct and intelligence and protests against the artificial separation of the two. He says that every act is instinctive, as viewed from without and intelligent as viewed from within, by the subject himself. Thus, the building of nest is instinctive as seen from outside. It is intelligent in subjective appreciation.² The subjective awareness, however, may be more or less elaborate. This marks the distinction between the higher forms of mind and the lower.

Lindsay representing the position of Bergson urges that the essential psychic feature is an impulse ; it is ever changing and yet it sets the organism into action. The acts are stereotyped, because they are purely physical and depend on physical organisation. The mental phase is a creative impulse which is ever new.³

A new turn was given to the discussion of instinct when Rivers suggested that Sherrington's idea of the all-or-none reaction might be applied to instinct.⁴ Head had shown that the psychological properties of instinct, such as the crudeness, the vagueness of spatial reference, and the immediacy and uncontrolled character of the response, are also properties of protopathic forms of cutaneous sensibility. Rivers therefore proposes that the forms of behaviour should be classified as protopathic and epicritic rather than as instinctive, intelligent, etc. Myers points out that the principle cannot be employed

¹ Symposium on Instinct and Intelligence, Br. J. of Psy., Vol. III, 1910.

² Myers, Br. J. of Psy., Vol. III, 1910.

³ Lindsay, Br. J. of Psy., Vol. III, 1910.

⁴ Symposium on Instinct and Unconscious, Br. J. of Psy., Vol. X, 1919.

in a great many cases ; indeed it has only a very limited applicability.¹ Also he does not agree to the separation of instinct and intelligence in the manner proposed by Rivers. Jung tells us that phenomena are not infrequently met with whose psychological mechanism is almost identical with that of instinct, which share the character of the all-or-none principle but yet are not instincts.² Hence he feels it necessary to use some other criterion for a psychological definition of instinct. Drever finds it desirable to recognise different strata in the psychical life and he regards instinct as belonging to the perceptual life of the sub-personal consciousness. He defines it as "a determinate conscious impulse which is not determined by previous individual experience, but which nevertheless enters into and determines individual experience and attitude."³ McDougall doubts the soundness of the all-or-none principle itself even in the case of a single nerve fibre or neurone. Granting that it is true it cannot be profitably applied to the study of instincts, there is every possible gradation of anger that an animal exhibits ; it may range from a faint growl to the most furious excitement. "That the instincts belong to the protopathic level seems to be roughly true, but nothing Dr. Rivers has said justifies us in going beyond this general statement."⁴ And McDougall adheres to his own conception of instinct which we have mentioned above.

In 1919 Dunlap first raised the storm against instincts, the magnitude of which he was able to gauge two years later when he said "that there seems to be a danger that denunciation of instinct will become as fashionable and as uncritical as the acceptance of instincts has been hitherto."⁵ He pleaded for giving up the term 'instincts' from psychology but he would retain 'Instinct' with a big I. What he meant by

¹ Myers, Br. J. of Psy., Vol. X, 1919.

² Jung, Br. J. of Psy., Vol. X, 1919.

³ Drever, Br. J. of Psy., Vol. X, 1919, p. 29.

⁴ McDougall, Br. J. of Psy., Vol. X, 1919, p. 35.

⁵ Dunlap, Are there any Instincts? J. of Abnorm. Psy., Vol. 14, 1919.

these terms we shall soon see, but before that we must consider another critic of instinct who delivered his attack with great zeal and thoroughness. We refer to the Chinese Professor, Dr. Zing Yang Kuo's article "Giving up Instincts in Psychology." According to Kuo all the theoretical assumptions that are made about the nature of instinct are fallacious and the methods of studying them unreliable.¹ Psychologists are seldom able to free themselves from bias and prejudice when they deal with the problem of instinct. This accounts for the remarkable disagreement among them in the matter of the classification of instincts. Principles of classification depend upon the interests of the authors. The so-called instincts are in the last analysis acquired trends rather than inherited tendencies. Innate action tendencies are as much objectionable as innate ideas. "If it is true that one cannot have an idea of a tree before one has actually seen or learned about a tree, it must be equally true that one cannot have any food trend before one has ever eaten food."² Instincts serve an end. But an end reaction may involve a great number of mechanisms or subordinated acts most of which may be acquired and yet the psychologists conveniently overlook them because of their interest in the end.

The genetic method of studying instincts discovers only random movements and no specific instincts. The general observation method is inadequate while experimental methods yield only doubtful positive results. Why then insist on the existence of instincts? Because every instinct has an adaptive function. Instincts are preserved in the race through natural selection. The arguments are both practically and theoretically ungrounded. How would we fare if in this present century of din and bustle we had inherited instincts suitable to meet the conditions of prehistoric life? Adaptiveness in

¹ Z. Y. Kuo, *Giving up Instincts* in *Psy. J. of Phi.*, Vol. XVIII, No. 24, Nov. 24, 1921.

² Kuo, *op. cit.*, pp. 648-9.

one generation does not guarantee adaptiveness in all generations. Moreover, actual facts disprove the contention that every spontaneous response of the young infant is adaptive. Is instinct a drive, an urge, as McDougall suggests? No. Observations show that activities of the new-born babe are aroused by external stimuli rather than by internal drives.

After thus demolishing every argument in favour of instinct, Kuo suggests a re-interpretation of man's native equipment. The human infant is endowed with a great number of units of reaction,—generally non-adaptive in character, with the exception of those which are connected with the vegetative functions—out of which all co-ordinated acts of the organism are synthesised, the nature of the integration depending to a large extent on the nature of the environment. Due to frequent repetition the bond between certain stimuli and responses becomes fixed; we have then habits. Habits may be re-organised in order to enable the organism to adjust itself to new situations. Certain elementary acts are not integrated with other reaction systems; they are reflexes.

In support of his view Kuo gives us an analysis of some instincts. The moral instinct is nothing but the combined influences of various social forces which begin to act on the child from its very birth. A child refrains from doing a particular thing at first merely for the fear of punishment, but through frequent exercise it becomes habitual for him not to do it, and if there be any occasion for a change in the habit, he feels an uneasiness which is interpreted by the moralists as the awakening of conscience. Let us take another example. The general opinion among champions of instinct is that a bird has an instinct to mate with another of its own species. But Whitman's experiments on the pigeons completely disprove the assumption. The male passenger pigeon that was reared with ring doves could never be induced to mate with one of its own species. Similarly a male pigeon

might be paired with another male and a female with another female. There is no meaning in saying as Hunter does, that what we have here is a modification of instinct before birth. The fact is merely that a different environment has brought out a different type of reaction. What is true in this case is also true in all other cases of instinctive activities. They are merely acquired tendencies of action, brought about by the operation of stimuli on the organism.

The main point in Kuo's theory then is this; what we generally call instincts are really habits formed under the stress of environment. Given the units of reaction and the environment, habits develop, which because of their similarity in all members of his species, pass off as something special, as a *tendency*, a *faculty*, an *inner urge*, etc., etc.

This is one common ground amongst all opponents of instincts. Dunlap finds no criteria by which we can successfully separate instincts from habits and says that from the purely physiological standpoint there are no instincts.¹ Dunlap however does not go so far as Kuo and while arguing that there are no possible lines of demarcation between different kinds of instinctive activities and therefore no separate instincts such as sex, food, etc., insists that there may quite well be such a thing as instinct, namely, action determined solely by the environment (stimulation pattern), and the constitution of the animal.

Indeed none of the authors, except Watson in his latest lectures, who have criticised instinct have ventured to go so far as Kuo.² Kantor, who led an anti-instinct cult to which Ayres and others belonged, does not deny the existence of human instincts and discusses in detail the relation between instincts and emotions.³ Watson who places instinct under

¹ Dunlap, The Identity of Instinct and Habit, J. of Phi., Vol. XIX, No. 4, Feb. 16, 1922.

² Watson, What the Nursery has to say about Instincts, Psychologies of 1925, Ch. 1.

³ Kantor, A Functional View of Human Instincts, Psy. Rev., Jan. 1921.

the heading of hereditary modes of response, defines it as "an hereditary pattern reaction, the separate elements of which are movements principally of the striped muscles."¹

The weakness of Kuo's position is this. He repudiates the contention of any *a priori* relation of the organism to its environment as is involved in the current conception of instinct and in the doctrine of innate ideas. But how does he then account for the similarity of behaviour even under similar environment? How can then environment determine in any way the type of behaviour the organism would develop? Tolman tells us that Kuo held a subsidiary hypothesis, namely, "Although all responses are originally random, there is an operative factor which determines that certain ones of them shall soon get learned (*i.e.*, attached to specific stimuli)."² What then is the nature of this operative factor? Kuo does not give us any hint. The concept of the 'units of reaction' under which it is possible to cover the whole difficulty in connection with the problem of instinct has also not been sufficiently explained.

Kuo wrote his article in 1921. About the same time Glueck, Sanger Brown No. II, Mcfie, Campbell and McCurdy were carrying on a symposium on the relative roles in Psychopathology of the Ego, Herd and Sex instincts.³ But their discussions were mainly concerned, as the very title shows, with the parts the various instincts play in psychopathology and not with the question of the nature of the instinct as such. Ayres preceded Kuo and maintained that for social psychologists there should not be any instincts. "The social scientist has no need of instinct, he has institutions."⁴ In a lengthy article about the same time Hocking does not find the

¹ Watson, Psy., Ch. VII.

² Tolman, Can Instincts be given up in Psy. J. of Abnorm. and Soc. Psy., Vol. XVII, No. 2, July-Sept., 1922.

³ J. of Abnorm. and Soc. Psy., Vol. XVI, No. 4, Oct.-Nov., 1921.

⁴ Ayres, Instinct and Capacity I and II, J. of Phi., Vol. XVIII, Nos. 21 and 22, Oct. 13 and 27, 1921.

physiological explanation of instincts to be sufficient, and refers to McDougall's criticisms of physiological theories where the latter points out that many of our important responses are responses not to sense stimuli, but to meanings (*e.g.*, the two telegrams—our son is dead and your son is dead).¹ But what about animal behaviour? More specially, what about the response of the animal for the first time, to a situation? We are brought back again to the point at issue between McDougall and Morgan. Hocking further points out that our instincts themselves are subject to control. They do not simply go off like a piece of firework when the fuse is lighted. Pugnacity, *e.g.*, is one of such instinctive regulators of instinct; it is excited by a hindrance to the operation of other instincts. But why should pugnacity be aroused under such circumstances? Because the instincts are but forms of the Will to Power to realise itself and anything resisting it must be removed. And instinct therefore according to him "is any specific form of the Will to Power which reaches its ends by the use of innate motor mechanisms, common to the species." This is a hybrid definition, but Hecking says "We have.....to make a choice between two positions, one of which is consistent in the midst of its apparent hybridism, the other of which is either in the presence of an ultimate and confessed mystery or else presents us with a helpless and unjustifiable torso of a man." Behaviourism has to patch up the elements of mechanism with mental cohesives. Future reference, memory, selection, etc., can never be resolved to, though they may be symbolised by, the characteristics of stimulus-reaction patterns.

Dunlap follows Kuo again with his article on the Identity of Instinct and Habit.² He points out that Kuo has made no distinction between instinct and instinctive activities and

¹ Hocking, The Dilemma in the Conception of Instinct, as applied to Human Psy., J. of Abnorm. and Soc. Psy., Vol. XVI, Nos. 2 and 3, June-Sept., 1921.

² J. of Phi., Vol. XIX, No. 4, Feb. 16. 1922.

while apparently rejecting the whole conception of instinct has reinstated instinctive activities under the changed names of the 'inherited action system.' He admits the presence of instinctive tendency which he defines as a certain arrangement in the nervous system. He illustrates what he means by tendency by referring to the electric door bell and its operation. When the button is pressed the bell rings because there is a mechanical arrangement of parts, and existing disposition of the sort that made the operation possible. Such tendencies in man might be tendencies to perceptual reactions, or emotional tendencies or thought tendencies. (Heidbreder also suggests that thinking may be regarded as an example of instinct.) He then critically examines the assumption that "there is a fundamental difference, in human and other animals, between instinctive and acquired reactions." If a child puts a piece of sand paper in its mouth for the first time and cries and after a number of subsequent presentations, turns its head away when the sand paper is given, the former is regarded as instinctive activity and the latter as acquired tendency. But are not the two reactions equally instinctive? Is not the nervous constitution of the child so determined by heredity that one stimulus produces one reaction (*viz.*, putting the sand paper at the mouth), and another stimulus (*viz.*, the repeated presentation of the sand paper) will produce another reaction (*viz.*, avoiding the paper). Even so with other instinctive acts. Each of them has a previous history as much as a habit has. "Practically we use the term instinctive reaction to designate any reaction whose antecedents we do not care, at the time, to inquire into; by acquired reaction, on the other hand, we mean those reactions for whose antecedents we intend to give some account."

The point that is raised here is one of perennial dispute in biological theories known as the question of 'Inheritance of acquired characteristics.' It is admittedly difficult to say in the case of any behaviour at all, animal or human, just

how much of it is due to inherited tendencies and how much to acquired trends. Should we then abolish all distinction between native and acquired as Dunlap does? If we retain the distinction, how should we define what is inherited: should we define it in physical or in psychical terms? Behaviourists are entirely in favour of the former interpretation. What is inherited is a physical structure, a neural tract and nothing else. Is not the function also inherited along with the structure? Kuo says that the child "is endowed with a great number of units of reaction" "out of which the co-ordinated activities of later life are organised." Geiger remarks, "At any rate, these units of reaction or elementary acts with which the individual is endowed at birth presupposes neural tracts which can only be described as 'inborn tendencies,' i.e., tendencies to perform certain definite responses and no others.¹

Geiger finds another contradiction in Kuo's interpretations of Spaulding's experiments on the flight of birds. A bird hatched and reared in a cage could easily fly without tuition and experience. That says Kuo was due to the maturity of reaction system and by that reaction system he meant "wings and other flying mechanisms:" What are those other flying mechanisms? Geiger asks "Do they not include nerve centres and nerve connections? And if so, must these not be thought of as forming and ripening in advance of experiences having to do with flight? To account for their tendency and ability, and the tendency and ability of other mechanisms involved to execute adequate flying movements by reference to their maturity is beside the mark; the question is, did the state of maturity result from the former efforts to fly? If not (as in the case of Spaulding's experiment), it must have developed out of conditions which were present in the organism at birth; in which case, I do

¹ Geiger, Must we give up Instincts in Psy. ? J. of Phi., Vol. XIX, No. 4, Feb. 16, 1922, p. 96.

not see that the notion of instinct can be excluded from a scientific interpretation of the facts."

From all these discussions it is evident that neither a purely psychological description of instinct nor a purely physiological or biological view of it is any longer possible. I do not think that anybody has been able as yet to convince himself of the needlessness of postulating some *a priori* connection between the stimulus and the response of the new-born babe. The form of this connection may be variously interpreted. It might be a tendency in the sense in which Dunlap uses the word; it may be a chemical action as Loeb suggests; or it might be a function of the ductless glands. Berman says, "The most interesting factor in the instinct equation is the endocrine, because that is the one that is most purely chemical."¹

But in this way however there seems to be no theoretical difference between what we call an instinctive activity and say, hearing. Hearing also presupposes a nervous tract with a definite tendency to respond to the auditory stimulus. We may say with Kuo, that out of these elementary acts those which we call instincts are brought about by co-ordination. But the difficulty is how is this co-ordination brought about? Whence this sudden co-ordination of the flying and other mechanisms in Spaulding's birds? Unfortunately we cannot remain satisfied with mere structural analysis of our activities. The difficulties that have been raised, the doubts that have been cast regarding the existence of instincts, are not mere isolated phenomena in the history of psychology. It is only a side issue of the crisis that has overtaken the science at the present time. Not only the traditional concepts, but even the more modern ones that were ushered in with great pomp with the introduction of the experimental methods in the science have to be re-examined.

¹ Berman, *The Glands regulating Personality*, New York, 1921.

One way out of this difficulty is pointed out by the Gestalt school of psychologists. One inherent difficulty of psychological studies is that we have to attempt to explain facts of one category in terms which belong to a different category altogether. Confusion and contradiction are bound to result whenever emphasis is laid either on the one or on the other. Laying stress on the physiological aspects gives us admirable analysis of certain conceptions used in psychology, but much of their adequacy is destroyed, whereas emphasising the psychical aspects leaves the denotation of the terms unsettled. As Hocking remarks, "We are faced with the alternative—Behaviouristic clarity with inadequacy and introspective adequacy with muddle."

The Gestalt school suggests that so long as the two categories are not recognised as forming one organic whole there is no escape out of the difficulty. This is not an abstract philosophical generalisation ; no psychological event can be satisfactorily explained without the assumption of such a hypothesis. The units of explanation should no longer be sensations, or nervous impulses, but Gestalts in which both of these are taken in consideration.

Instinct does not appear as "a multiplicity of separate movements, but as one articulate whole embracing an end as well as a beginning."¹ It is like a melody instead of an irregular succession of tones. It is adapted to the stimulus. It also possesses the same forward direction which is the characteristic of voluntary actions, though the end towards which it is moving is not known to the animal. Any present stage in the activity is "not a state, but a transition ; not a being, but a becoming." "So long as the activity is incomplete, every new situation created by it is still to the animal a transitional situation ; whereas when the animal has attained his goal, he has arrived at a situation which to him is an end situation."

¹ Koffka, *The Growth of Mind*, New York, 1924.

It is impossible to frame any scheme of chained neurones, as Thorndyke attempts, to suit the requirements of instinctive activities. Koehler finds nervous processes have a share in occasioning such phenomena as rhythm, figure, etc. Koffka therefore suggests that the nervous processes may have a share in occasioning instinctive activities also, for objectively considered they belong to the same category as melody, figure, rhythm, etc. But then these nervous processes themselves "must embrace all the essential characteristics of the phenomena in question."

Do these nervous processes exhibit the phenomenon of 'closure' which is the characteristic of the activities referred to above? Koehler finds that even the inorganic processes do show this phenomenon. The problem with regard to instincts therefore,—for it is still a problem—is "not to discover an inherited system of connected neurones, but rather to investigate what kind of physico-chemical 'closure' produces these astonishing types of behaviour, and under what conditions."

The Ways of Sex

H. D. BHATTACHARYYA

(II)

In this matter of pornography a very considerable change has overtaken modern taste. It is probable that the delight in perusing such literature has never been absent in any community, and where such literature was not to be had in abundance the sexual instinct of the community satisfied itself by patronising love-themes and comedies. But our ancestors found gratification in older literature of this type raised above criticism by its halo of antiquity and by a complacent rationalisation that its popularity was due not to its sexual appeal but to its being a mirror of contemporary taste and social condition; they disapproved, however, of contemporary compositions evincing a bad taste and tending to produce bad morals. Thus while, in England, Elizabethan and Caroline poets might be read and discussed and Fielding might be appreciated and enjoyed, it was tacitly understood that no contemporary composition of a lewd type should be encouraged and openly circulated. But modern society braced itself to the task in two ways. It began to print, at first only for private circulation, extremely lascivious literature of the near past, e.g., of George Reynolds, which, because of the prohibition of sale attached thereto, did not fail to excite curiosity or find ready readers; it also began to translate such literature of other countries into the vernacular under the thinly veiled garb of enriching the latter and opening up a cosmopolitan outlook upon life. The sudden 'enriching' of the English literature with the translations of the works of Maupassant, Flaubert, Anatole France, and other Continental writers, not to mention the older name of

Boccaccio, is really the opening of the floodgate of repressed sexuality, and it is yet too premature to predict whether the flood will enrich the exhausted soil or destroy the standing crop. While the ordinary reader is making no secret of his zest for such literature, the expert is hiding his real thought to himself as well as to others under the cloak of specialisation. But the real is with every one of us at all moments, and it is for the ideal that we seek international co-operation. A constant search for the real of this type argues an exaggerated sexual impulse which always seeks fresh materials to feed itself and mistakes its insatiable gluttony for healthy hunger. It is a mistake to think that sexual curiosity would ever end by our knowledge as to how other men in other climes lead their sexual lives. Like addiction to narcotics it will require regular stimulation and a predisposition will grow into a habit. The danger becomes more insidious when both sexes not only read this literature but can and do discuss the same between themselves; for then this will provide an opportunity to give vent to one's sexual thought under the aegis of aesthetic or literary criticism which is not ordinarily permissible between the two sexes in a decent society. Just as in the exposition of classical dance, an element of impersonality is introjected into this situation also; and the exponent fondly imagines that he is not the slave of a suppressed passion but the mouthpiece of an aesthetic viewpoint or a literary standard.

But although literature can supply materials for eroticism by depicting scenes that stimulate sexual thoughts, its effect is proportional to the capacity for ideal reconstruction in the subject. Now, although the phenomenon of psychic impotence in males is proof positive that ideas play an important part in erotic situations, there is yet no doubt that the presence of the object of gratification in a more concrete form is more stimulating than an ideal representation. No wonder, therefore, that the cult of the nude in art is more

widespread than the devotion to realistic literature, especially among those whose imperfect education does not enable or prompt them to take the trouble of thinking when a less intellectual mode of gratification is available! Besides, literature can only describe the sexual act but not adequately present the object. The position is reversed in art where the object can be presented but not the act (if we exclude from consideration mechanical contrivances which may present figure and action together). The degree of excitement will depend upon the amount of verisimilitude that art has to reality. While a tridimensional representation, as in marble, approximates more nearly the actual spatial properties of the living model, a painting or a picture, although lacking the third dimension, may be more exciting by its imitation of the contour and colour of the original; and for the same reason a photograph may be most exciting when known to stand for an actual subject.

This interest in pictorial art is sometimes a very sure index of the taste of the collector. There are some who find beauty only in landscapes—their drawing room breathes a passionate fondness of nature which they nurse by immobilising her scenic aspects within the framework of a picture. But there are others more interested in man than in nature, who prefer human figures to bare landscapes; when such persons are prone to sexuality the pictures are almost invariably of the opposite sex, whether these figures are draped or semi-nude or nude and whether the subjects are religious, mythological, imaginary or actual. Where the interest is in the sexual act, the performance is for a pair of lovers in various poses or for mixed gatherings.¹ But where the main interest is in the person and there is an unconscious jealousy in witnessing mute representation in colour and marble of other people's love, the picture is of a single figure of the

¹ I may refer in this connection to two pictures by Orlando Norie and one on the Queen of Sheba by F. Matania, reproduced in the *Sphere* of April 30, 1927.

opposite sex or of a group of such figures. The tendency to mask such sexual feelings may result in an interest in classical subjects—in the birth of Venus, in the dance of the three Graces or some such themes of antiquity. It may show itself, for instance, in an appreciation of Indian art—in studding the walls with figures of women with exaggerated breasts and buttocks. It may choose even a religious theme like the first dawn of shame in Adam and Eve clothing themselves in fig-leaves or a mythological subject like the stealing of cowherdresses' clothes by the amorous Krishna or his joy-ride on the nine girls who intertwined their bodies into the shape of an elephant. It may show itself in anthropological interest in savage tribes whose women do not clothe themselves or do so only scantily; even in decent papers of the present age such nude figures are freely shown in pictures. The more lewd the taste, the more exposed the body and the less subtle the sexuality, the farther removed are the themes from classics, religion, mythology and anthropology. The collection of what are called French cards has nothing but a lascivious imagination to defend itself. Where such open sexuality is absent, interest in the members of the opposite sex may manifest itself in the collection of pictures, if not in gilded frames, at least in wall-calendars of the year. The principle of advertisement through calendars, posters and trade-marks is in many cases purely an appeal to the subconscious interest in sex under the garb of aesthetics, for beauty in ordinary minds is almost synonymous with a comely figure, mostly of a woman.

The nude in sculpture and architectural design lacks the hue of the living frame and is not generally representable in an elaborate lascivious setting as the nude in painting is; but its main appeal is to the sense of proportion in three dimensions which painting fails to satisfy. Its costliness has limited its circulation in the community and except in the gardens or drawing rooms of the wealthy or in public museums it finds

very little place elsewhere. But some of the classic figures in sparing costume have not failed to attract the sexes by their sensuous appeal (for a well-formed bare body of the opposite sex, if it is not an everyday sight, is exciting to both sexes) and supplied as substitutes of themselves pictorial imitations to many a drawing room all over the world, e.g., Venus of Milo. They have, again, drawn visitors whose admiration is a curious amalgam of sex and sublimity. The constant stream of visitors that sweeps past the attractive figures in picture galleries, museums and monuments of art is mostly composed of persons whose sexual curiosity and erotic feelings are stirred by such representations and who lack even the rudimentary qualifications for intelligent aesthetic appreciation. They simply choose the cheapest way of a momentary sexual intensification without always knowing it. Are the tourists to Pompeii actuated solely by the desire to see an Italian town re-exposed to view after so many centuries or do stray reports about scenes of decadent morality reach their ears in many cases before they make up their mind? Does Kanārak in Orissa attract visitors on account of its aesthetics or religion or for its hundreds of human figures in obscene poses? Scenes and situations of past sexuality or figures in stone or canvas may indeed lack the warmth and glow of living frames, as in theatres and dancing halls, but then they do not wince under the prolonged and penetrating gaze of lascivious eyes or cower under the rude touch of lustful hands. It is only honest to remember that the capacity to appreciate an eroticising figure or situation calmly, as the artist is supposed to do, is not very general and that where the necessary culture is lacking the inner significance of the artistic product is overwhelmed by the tide of outward sensuality.

This has happened not only in art but also in religion more than once in the world's history. Of course, I do not mean to suggest that the artists themselves have always been free from sexual motivation in the production of their art, for the

instances in which some artists have almost invariably chosen a female figure in various stages of nudity are too oppressively prominent to exempt the artists as a class. While we are grateful to such artists for immobilising poses true to life we feel at the same time that probably the same erotic feelings are present in their production as in their appreciation. The same remarks apply *mutatis mutandis* to the growing sexological literature. The writers may sometimes spread information in the community from a disinterested sense of diffusing a knowledge which is of such vital importance to everybody ; but they may also be sexually prompted in the matter and find the same satisfaction while dwelling on the theme and parading their sexual knowledge as inverters do by exhibiting their organs. The freedom from social restraint which an author now possesses was once possessed solely by teachers who could address only such persons as signified their intention to hear discourses on sexual matters by joining their special class, with this difference that the authors have not to pick and choose their readers (except when they print their books for a limited circulation) and can always rely upon a favourable reception of their products in the community, for sex is with every one of us.

The social restraint in matters sexual is thrown off or evaded by men and women differently according to their in-born or acquired dispositions. While a refined mind will go no further than an appreciation of art, literature, song and dance in which sex plays a part, a coarser nature will not only gloat over the debased forms of these but will also employ its thought, speech and deed in the service of erotic *motif*. A man's inmost sexual thoughts are accessible only to himself and cannot be directly detected by others. But there is no doubt that in a perverted mind even innocent situations, sacred or profane, may easily take on a sexual colouring by the habitual grossness of imagination. Such a mind projects on to the world the colour of its perverted nature and scents

sex everywhere, and a member of the opposite sex, whatsoever be the relationship, is interesting because of such a sex and for no other reason. The Freudian instances of the Oedipus and the Electra complex (the mutual fondness of mothers and sons and of fathers and daughters) are only everyday cases of an instinct which affects the relations of men and women, howsoever connected, and which in extreme cases converts every member of the opposite sex into an object of libidinous desire.

Where, however, this extreme length is not reached, the hidden sexuality manifests itself only in ribald talk, smutty jokes and obscene oaths. The first two imply a certain community of thought and are most frequent in a company of persons belonging approximately to the same age and generally also to the same sex. In a mixed gathering ribald talk is possible only in squalid companies, but smutty jokes are found even in comparatively decent societies and may be indulged in by designing persons as tentative sexual sallies to predispose the hearer to grosser sexual acts. The degree of control over one's mind determines in many cases whether the talk should take the form of unrestrained and continual sexual discourse or the form of subtle and occasional wit-sallies ; and the control may be loosened as much by voluntary relaxation, *e.g.*, in the company of one's own chums, as by extraneous conditions, as for instance in a state of intoxication. Certain environmental factors may, again, operate to hasten the withdrawal of restraint, and this explains why ribald talks leap to mind in lascivious scenes and eroticising dramatic representations. Obscene oaths are sudden and violent ways of breaking the social restraint under the impulse of some strong emotion, generally anger (except when they have grown into habits by repeated indulgence), and are often, paradoxically enough, not accompanied by corresponding sexual thoughts. They are formal, rather than material, protests against social restraints in sexual matters

and are meant to be avowals of the utterer's right and intention to break society's most rigorous discipline about unlicensed freedom of sexual union as a vengeance for thwarting his individual will. As the active part in the sexual act belongs to the man, his obscene utterances generally take the form of an expression of his polygamous instinct in speech or gesture, while the woman who is monogamous by nature finds satisfaction only by vilifying the sexual life of the subject of her ire or some of the latter's relations, which, to her feminine eyes, represents the highest kind of moral fall. When she follows the male mode of obscene utterance it is by pure imitation just as the post-coital attempt of a female animal (*e.g.* pigeon) to cover the male is.

When obscenity transcends the bounds of speech, whether as ribald talk or as smutty joke or as vulgar outburst, it issues forth in the form of gesture, writing or representation. When obscene speech does not suffice to express the full strength of an emotion, lewd gesture representing the sexual act and even culminating in exhibitionism may take its place. But even under normal conditions a heated sexual imagination sometimes finds an irresistible impulse to put down sexual thoughts in writing. In the walls of lavatories, generally of trains and public buildings, may be found the work of lascivious minds in words and pictures announcing the bare fact of the contact of the genitals or the pleasure to be derived therefrom or the writer's intention to hold sexual union with certain specified or non-specified women or referring to the sex-life of somebody else. The writing may be timid and furtive and, therefore, faint, showing that the writer is conscious of the impropriety of such scribbling or is afraid of being detected in the act or in the long run by his handwriting; or it may be bold and large, showing the writer's strong imagination or scornful defiance of social decorum. In co-educational institutions there is an additional motive in such scribbling, for it

is meant to excite the female sexually or it at least serves to satisfy the writer himself sexually by the thought that some women (on whose desks also obscene remarks are sometimes written or incised) would notice the writing. Mere private enjoyment is seldom a motive, for obscene remarks and pictures are generally found only in public places frequented by large bodies of men, or men and women both, in incised characters on wood or newly plastered walls (which by their yielding character simulate the female genitalia or else satisfy the sadistic tendency of the scribbler), in pencil and chalk work on tables, walls and glass-panes ; they are also found in the margin of books meant for general circulation. In pictorial representations the human figures are dispensed with and their places taken by genitals in the act of copulation.¹ The intensity of the feeling prompting the symbolism is reflected in the exaggerated dimensions of both the genitals and the priapic condition of the male organ. The same motive is at work in the obscene temple-architecture of Orissa, where may be found an exaggerated phallus at Bhubaneswar and exaggerated genitals and female breasts in various other places as decorative art so that the real motive is seldom hidden from view. It is no wonder that in such 'artistic' surroundings the original ideal of pure virgins dedicating their lives to the service of the god should degenerate into the system of temple prostitution (*devadāsi*) which, once introduced into any religious environment, has a dangerous tendency to spread its corrupting influence all around.

This brings us to the very much debated question of the intimate connection between religion and sex. When at their acme, both involve an impulse of self-surrender and also of an identification of self with the other being which very closely borders on self-dissolution. The sublimation of sex in religion has been so frequently observed in passionate natures

¹ Single nude figures of saints in religions which believe in extreme asceticism, e.g., Jainism, are not necessarily prompted by obscene motives.

from St. Augustine in Africa to Suradāsa in India that we have ceased to marvel at the phenomenon. Similarly, there is a trite saying in Bengali that an ageing harlot is a potential hermit. The reason for such transformation is to be found in the fact that once the yearning for an object of affection is purged of its human and ignoble element the psychic energy thus freed is rendered available in the service of God to whom the affection is now turned. For the same reason the most rapturous divine lyrics have come in India from the pen of a disappointed husband, a passionate lover and a widower living in sweet remembrance of his departed love. The language of affection gains in intensity and definiteness from an unconscious identification of the human and the divine and it is sometimes difficult to determine which object is meant. The matter becomes further complicated when the conjugal ideal of love is imported into divine relation, as for example in Vaishnavism, for there under the garb of describing the mutual love of the divine pair the poet pours out the wealth of his lascivious imagination, voluptuous passion, or sentimental affection into his descriptions which thereby become possessed of a realism and an appeal not attainable under any other conditions. There is, as in reading the tales of human love, an unconscious identification with either member of the divine pair according to the sex of the writer or the reader. The truth of this remark will be borne out by every candid reader of Vaishnava literature in which the love of Krishna and Rādhā is described, even though that may not always reach the erotic level of the Gita-Govinda.

It is not improbable that the gradual transformation of the conception of godhead towards the conjugal type owes its origin to the importunities of the sexual need. A stern God who commands awe and obedience must in course of time yield place to one who can reciprocate human affection as a loving father or provide an intermediary who can do so. The cult of the Madonna, "the glorified Bride of the

celestial Bridegroom," with or without the divine child had a human appeal which it would be useless to deny and which in the minds of less elevated artists under the Medici prompted pictorial representations against which Savonarola hurled the thunderbolt of his vehement denunciations. Do we not have among the frescoes of the Vatican the infamous Borgia (Pope Alexander VI) kneeling to Giulia Farnese in the character of the Madonna? Think again of the nuns who abjured the normal human relations of sexual love and yet felt no shame in calling themselves "the brides of Christ." Need I refer also to the many *houris* with which the faithful followers of the Prophet of Arabia are promised to be rewarded in heaven? So, even in austere faiths, direct or indirect provision has to be made for the tender emotions somewhere: in tender faiths where the conjugal union is imported into the divine relation itself as in Vaishnavism, Saivism and Tantricism (both Buddhistic and Hindu) in India and in the religious cults of Egypt, Assyria, Greece and other lands, the divine object of contemplation at once provides an unconscious gratification of the sex impulse and sows the seeds of conscious sexuality in honour or imitation of the divine relationship. When divinity is conceived as singular and sexed, the sex attraction of the worshipper is minimised by representing the male as old (and therefore unattractive to women) and the female as terrible (and therefore repelling to men). The survival of the Śakti cult in India in the form of a worship of the terrible Kāli or the fierce Durgā form is easily explained when we remember that an attractive Divine Mother may give rise to the Oedipus Complex while a terrible form gratifies the sex impulse and at the same time prevents lewd thoughts. Those acquainted with the religious cults of India can easily understand why of the five deities, Suryya, Ganeśa, Siva, Vishnu and Śakti, the first two should command decreasing

adoration. They rouse no sexual interest while the remaining three, by virtue of their marital relation, satisfy the sexual cravings of the devotees. Of these, again, Vishnu (especially in Rādhā-Krishna cult) and Siva in association with his spouse (whether as a figured deity or as a symbolic phallus in conjunction with the female form or symbol) command universal veneration, while Śakti-worship has developed into a kind of mother-cult which is more popular among men than among women. The unconscious Oedipus Complex is satisfied by relegating the husbands of the various Śaktis to the background : we do not hear much about the consorts of Sitalā, Manasā, Saṣṭhi, Saraswati and such other female deities and if Kālī has a husband, he appears under the feet of the terrifying goddess and in that sorry plight gratifies the vindictive jealousy of the worshipper towards the Divine Mother's consort. That wine and women should be regarded as essential ingredients in some Tantric forms of Śakti-worship is proof positive that the humiliation of the male element in the divine relationship was not meant to be taken as a suppression of the sexual attitude. In more refined forms gross sexual enactments of married people gave way to the worship of young virgins (Kumārī) which kept up the female element (representing the Divine Mother) but subdued the libidinous impulse.

But let us now descend from the obscure heights of religion to the visible plane of everyday experience. He who runs may read the signs of the time in its altered conception of what constitutes propriety. The biological hermaphroditism from which no person, male or female, is absolutely free has its counterpart in the psychical hermaphroditism which occasionally prompts individuals (and even races) to assume the bodily and mental attitude of the opposite sex. I shall confine my remarks to the obtrusively prominent masculinity complex of women at the present time. To quote a few observations of Karen Horney :

"Just as woman, because her genital organs are hidden, is ever the great riddle for man, so man is an object of lively jealousy for women precisely on account of the ready visibility of his organ." "The manifestations in the mental life of women which spring from the objection to being a woman are traceable to their coveting a penis when they were little girls." "The difference in the dress of men and women, at least in our civilised races, may be traced to this circumstance that the girl cannot exhibit her genital organs and that therefore in her exhibitionistic tendencies she regresses to a stage at which this desire to display herself still applied to her whole body. This puts us on the track of the reason why a woman wears a low neck, while a man wears a dress-coat." But there are other manifestations too. Not only is immodesty in dress not confined to ball-dances now-a-days but it is availing itself of every opportunity to manifest itself. Whether in the sea-beach or in sunlight-cure institutions or in private gatherings or even in churches, the possibility of the presence of males is enough to prompt a mode of dressing which, says Talmey, "is a creation suggested by the demi-mondaine and designed to increase her trade by exciting the passions of the opposite sex." But women's dress now-a-days not only begins late but also ends early, and this altered fashion is probably due to women's imitation of the mode of wearing short trousers which the late war made universal among soldiers. It is woman's retort to man in the matter of showing the calves and thighs and exciting her erotically. That imitation of the male plays a great part in the life of the present-day women is evident from the facts that they are beginning to wear trousers like men, to ride astride, to smoke, to bob and shingle, to play cricket and football and even to swim the English Channel and to cross distances on foot, by motor or airship. The more they are beginning to realise that for a good many the married state is an impossibility

the more they are seeking satisfaction in psychic erethism by taking to professions like law, business, office and shop assistantship where they and their male colleagues mutually excite one another. They are no longer content to turn into severe schoolmistresses or prudish hostel superintendents or demure nuns and missionaries; in all their new transformations the psychology of the "penis-envy" is at work and they emulate the men in adult age in pretty much the same way as in their girlhood they tried to urinate like boys.

And what are we to say of the men? Is there no decided preference for mixed meetings, casual or regular, in almost all civilised societies now-a-days? Beginning with mixed doubles in tennis and mixed partnership in dance, it has encroached upon many other fields of social, political and economic intercourse, and in mixed bathing in light costume that throws into relief the contour of the entire frame of both sexes it seems to have reached a stage beyond which the only remaining state is that of partial or complete nudity. Can it be denied that mixed education has an element of sexual attractiveness as much to the teachers as to the scholars and that the presence of ladies, whether in public gatherings or in the class, adds a zest to speeches which is lacking when the wonted hearers of the opposite sex are absent? Do you feel like one inspired when talking to a mixed or female gathering and are you annoyed or vexed if you cannot acquit yourself well in the presence of ladies? If you do, an unconscious sex-motive is surely at work. Do you find more pleasure in female company than in the company of your own sex; are you thrilled by the voice of women; are you proud to be recognised and accosted by them in company; do women's letters give you delight and do you linger over their contents or preserve them for no particular reason; do you feel a peculiar pleasure in being of any service to them, *e.g.*, in escorting them or carrying their cloaks or

organising their charity performances; do you laugh and chatter immoderately in their company as if to monopolise their attention ; do you fondle children in their presence as if to show how affectionate you can be ; do you trim your sail according to the temper of your female company—by meekness before patronising women and blustering before admiring ones; do you passionately defend women's cause, extol their slender achievements and gloss over their glaring failures in all matters ; and are you impatient of any criticism of their cause and conduct ; have you as an examiner a tendency to overmark ladies' answer-books or, by way of defence-reaction, undermark them ; are you a champion of ladies' days in shows and festivals and think how nice it is to act as a gate-keeper or as an escort in such exclusively female gatherings ; do you employ young maid-servants, young typists and young shop-assistants ; does women's handiwork have a fascination for you ; are you curious about the kind of talk women have among themselves ; do you wish that they should have no reserve before you and do you press them to open themselves to you?—if you suffer from any of these symptoms, then you are a victim to sex-attraction even though you may not know it. You will probably protest against this insinuation and ascribe your bias towards women to a disinterested champion-ship of the cause of the frailer half of society : but the more vehement the protest the surer is the sign that you suffer from sexual leanings.

And now a word of caution at the end. A person's sexual life or tendency is not to be judged by isolated behaviour or occasional conduct nor is sex the only motive in many pursuits and avocations. A philanthropist may help the cause of women just as a libidinous person does and a gynaecologist need not always be a bawd. In arriving at a conclusion regarding the sexual tendencies of any man you are to study him in various situations, and if all his acts have a strong family likeness and all the evidences point to a single type of

reaction to the opposite sex, you would be justified in coming to a definite conclusion, but not otherwise. It is not sinful or unnatural to be deferent in your attitude towards the opposite sex. But there is a stage beyond which interest in the opposite sex amounts to morbidity or perversion. There are in the world many matters other than sex in which you are expected to take interest, and in so far as you fail to take such interest or you see in everything nothing but sexual manifestation you verge dangerously upon sex-mania. One need not be a pervert to deserve social condemnation ; every preoccupation with sex, in so far as it does not admit of a healthy transformation when the occasion so demands it, is to be viewed with suspicion and relentlessly exposed in the interest of the individual himself.

Visual Perception of Geometrical Figure

M. L. GANGULI

It is a well-known fact that gaps and lacunae in the series of stimuli are filled up or neglected in perception. It frequently occurs in correcting proofs and revising manuscripts. The question arises in regard to the size of the gap which can be thus filled up. A quantitative estimation of this kind cannot be carried out with the materials of our daily life. A laboratory setting is necessary for the purpose.

The series of experiments reported in this paper was undertaken with a view to determine the amount of omission that passes unperceived. In order to eliminate meanings so far as practicable a simple geometrical figure, a circle, was used. There were gaps of various extents in the circumference. An attempt was made to estimate the threshold-value of the unfilled space in the circumference perceived as complete.

The experiment is based on 2,500 readings collected in the course of the last few months. The circles used in this experiment were of two sizes, namely, with 5·2 cm. and 6·4 cm. diameter. The gaps were graded by 5 degrees from 0 to 45. The openings were presented in four different positions, namely, Up and Down, Right and Left, to be called hereafter A, C, B and D respectively.

The method of Right and Wrong Cases (Constant Method) and also the Gradation Method were employed for the determination of the threshold. The general instruction to the subject was that he should attend mainly to the task and not to the sensory-motor adjustment necessary for the apprehension of the figures.

In the case of the Gradation Method the subject was aware of the nature of the figure. In the case of the Constant Method, however, varieties of geometrical figures were

interpolated in the series. The subject was accordingly instructed not to anticipate the nature of the figure. It was found, as will be shown later, that this procedure yielded a better result than the other method.

The portable camera-tachistoscope (Whipple) with an exposure time of about 3.5σ was employed for the presentation of the figures. The subjects, seven in number, were familiar with the laboratory setting.

Results :

(1) The results show that there is a considerable difference between individuals in the matter of threshold. In most of the cases the difference varies from 14 to 38 %.

(2) The threshold-value changes with the position of the gap on the circumference. Thus the value is the least at the "A," "B" and "D" positions and the largest at the "C," or downward position.

Table of Data.

Serial N o. of Subj	Threshold by Const. Method in Deg.								Av. Threshold by Grad. Method in Deg.							
	Small.				Big.				Small.				Big.			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
1	5.5	7	28	7.5	6	<u>5</u>	25	7	7.5	5	10	7.5	10	7.5	5	5
2	5	<u>5</u>	6.5	5	<u>5</u>	6	13	5	2.5	12.5	12.5	7.5	5	2.5	17.5	7.5
3	<u>5</u>	<u>5</u>	10	<u>8</u>	5	<u>5</u>	10	<u>5</u>	2.5	2.5	5	7.5	2.5	2.5	7.5	5
4	...	...	15	...	...	...	15	...	5	2.5	7.5	2.5	5	5	7.5	5
5	...	<u>5</u>	10	<u>5</u>	...	...	...	...	2.5	...	5	2.5	...	...	...	...
6	...	...	...	...	...	...	...	...	27.5	...	...	...	25	22.5	42.5	32.5*
7	...	...	...	...	...	...	...	...	2.5	7.5	17.5	2.5	...	...	...	...

Note.—Underlined 5, 10, 15 indicate threshold value below 5, 10, 15 respectively.

* In this case the values of the thresholds are very high. History discloses that full correction of eyesight is not possible by means of suitable glasses. According to medical opinion this is due to the defect in the retina.

(3) The size of the figures does not seem to have any marked influence upon the threshold-value measured in terms of degrees. Thus the opening in the circumference bears a definite ratio to the whole circumference. In other words, the threshold value is not absolute but relative to the size of the figure.

(4) The values obtained by the application of the different methods do not tally. But preference might be given to the values obtained by the Constant Method in view of the suggestion that in the Gradation Method in which the subject is allowed to have partial knowledge there is a tendency on the part of the subject to fixate the gap and not the whole configuration.

This raises the question whether any part of the figure receives special attention under the conditions of this experiment. A number of cards with indentations and dots close to the circumference of the circle were exposed in all the four positions as in the previous series. It was found that :—

The upper position of the field is better noticed by some, while the lower portion is more fully attended to by others. It must be said, however, that when the circumference of the circle was marked in any special manner (indentations) the marks in the upper position were always better noticed than those in the lower. Of the two lateral sides the left was better perceived. But under certain conditions, which I am yet unable to specify, scores on both sides appear equal. Thus the results so far obtained do not enable me to conclude that any part of the field has an absolute advantage over the other parts.

The perception of the figures exhibits certain interesting features. In some of the cases the circumference is the dominant perception ; it appears in relief over the white background. Thus, the figure has the appearance of a black border with a depressed white background. In other cases, however, it is the white field which exhibits elevation and the

dark circumference-mark recedes. Both the circumference and the white surface may serve as the basis of judgment with respect to *completeness* or *incompleteness* of the figure. The same features enable the subjects to form an estimate of the *character* of the figure.

The principal issue which emerges from these experiments is the difference in threshold-value between the upper and the lower portion of the field.

We know that "the upper halves of letters furnish better clues to words than the lower halves."¹ The data obtained here, seem to support this conclusion. It is probably for this reason that the threshold-value for the upper portion is smaller. The larger threshold-value for the lower portion can be accounted for partly by the hypothesis that the perception of the upper portion of the circle like the perception of the upper portion of a letter, offers a clue to the character of the whole configuration. Thus, if an idea be formed that the figure exposed is a complete circle the opening must be a large one in order that the judgment may be altered.

Another ground of judgment is to be found in the phenomenal character of the field as described by subjects. The basis of judgment is not a geometrical line or surface but a whole figure with a meaning and a number of definable properties. The perception of the upper portion determines the awareness of meaning and the properties of a figure as a whole. Hence the threshold-value of the lower portion should be a large one in order to be perceived.

¹ Poffenburger, Psychology in Advertising, p. 421.

APPENDIX

Introspection (A)

Serial No. of Subj.	Introspection,	References.	
		Card No.	Position.
1 & 6	Circles seemed elliptical (vertical elongation).	7, 9, 21, 1	A
2	(i) In doubtful cases lines of the figure seemed broader and hazy at certain locality (in the area exposed). (ii) Line of inner circle seemed broader and blacker than that of the outer circle.	2, 3 45	C A
3	Shades (darkness) appeared in doubtful cases around a definite locality of the figure.	...	...
1, 2, 3, 4 & 7	Incompleteness appeared at two places on opposite sides but subjects are not confident whether the incompleteness lies on one circle or on both.	47	...

Introspection (B)

Serial No. of Subj.	Introspection.		References.	
	Primary factor.	Secondary factor.	Card No.	Position.
1	(1) White Surface	... ...	8	B
	(2) White Circle, Sense of release ...	Lines	24	A
	(3) Dark lines	... Figure (hollow)	2	D
	(4) Net-work of lines ...	White background	44	...
	(5) White surface	... Lines	21	...
	(6) Figure (raised)	... White background	21	...
	(7) White circular slip (raised), Sense of release.	Lines, Central white space	47	B
	(8) Dark lines	... Central white space (hollow).	1	...
2	(1) Lines	... Central white space (raised).	3	A & D
	(2) Lines	... White surface (raised)	47	B
	(3) Lines	... White surface (raised)	44	...

Summary of Judgment :—

Serial No. of Subj.	Judgment	Card No.	References Position
1 (a) Top—Greater number of dots (detected). 91 %	}	21	A-C
Bottom—Lesser number of dots (detected). 12 %			
(b) Top—Greater number of dots	}	1	A-C
Bottom—Lesser number of dots (also not definite)			
(c) Right—Lesser number of dots	}	1	B-D
Left—Greater number of dots			
2 (a) Top—Lesser number of dots 50 %	}	21	A-C
Bottom—Greater number of dots 100 %			
(b) Right—Lesser number of dots 50 %	}	21	B-D
Left—Greater number of dots 100 %			
(c) Top—Greater number of dots 100 %	}	1	A-C
Bottom—Lesser number of dots 33 %			
(d) Right—Lesser number of dots Nil	}	1	B-D
Left—Greater number of dots 75 %			

Notes and Abstracts.

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Sensuous Determinants of Psychological Attitude :
H. L. Hollingworth.

The paper presents a critique of the current standpoints in psychology in the light of the principle of redintegration as developed by the author. Behaviourism is said to be guided by a visual bias in as much as only those facts that are visually perceived are accepted as psychological data ; other facts are interpreted in visual terms. In structural psychology, all modes of perception are accorded equal status. The data, consequently, comprise those visually perceived and those perceived by the other senses. But according to structural psychology the psychic states, the stimulus and the body belong to three orders of reality. Yet mental processes are supposed to refer beyond themselves to alien facts. Such a position is difficult to maintain ; all facts with which psychology is concerned must be regarded as facts of experience. James' theory of *pure experience* and the Realistic view of *neutral entities* represent the philosophical protest against trinitarianism in psychology.

The Gestalt-Psychology is a form of structural psychology in as much as it is concerned with an isolated world of psychic facts. With Gestalt-Psychology as with structuralism, there is a difference in reality between the mind, the body and the stimulus. Moreover, the Gestalt-school insists upon a distinction between the *functional* and *descriptive* concepts. Facts which any one can determine are called *real facts* and concepts representing them are termed functional concepts. Facts which can be observed by a single person are experiences

or phenomena ; the concepts which represent them are descriptive concepts. Such a distinction between the two sets of facts is essentially arbitrary. We are only sure of our own perception of an event. Whether others have perceived it or not is an inference or assumption. Thus, the Gestalt-school attributes reality to what is assumed or inferred and not to what is actually observed. The author suggests that the distinction between the physical and the mental should be made within the total field of experience, "The mental items are natural events that are variable, uncertain, reported with contradiction and which instigate the type of sequence which we call redintegrative." The paper proceeds to interpret the different psychic functions in terms of the principle of redintegration.

*The Psychological Theory of Form :
Eugenio Rignano.*

The paper presents a critique of the Gestalt theory. The theory has gone deeper than associationism in explaining order and arrangement. It has insisted upon the necessity of assuming certain central processes which arise along with different nervous processes. These make "a short circuit whereby there is established a complex system of neural distribution, whose modes depend not only on the quality of the specific elementary excitations but also on the arrangement and spatial relations existing among these elements." But at the same time, the theory denies the qualitative autonomy of elementary sensations and of the constituents of a complex whole. This, according to the author, is an unjustifiable procedure. Again, the term Gestalt is applied to all sorts of unities. Form, shape, and order are sensuous in character and may be amenable to Gestalt Explanation. But the theory fails in the case of *affective unities*. Peter and Paul may agree in their perceptual report of particular items. Yet their experiences would diverge in fundamental respects. This

happens because they are obeying different affective drives, which arouse in them mnemonic contributions hasty and transitory in character that are likewise different. Further, the sensuous unities of form and order are different from unity of meaning and the unity of the concept and its particulars. Yet the Gestalt theory regards all these unities as instances of the Gestalt. The author concludes that the school has made no advance beyond the filling up of the gap left by the association theory in the explanation of form and order.

The Gestalt Hypothesis :

R. M. Ogden.

The author gives an exposition of the Gestalt theory in regard to the question of elements. Every element is a 'gradient of a perceived behaviour' and as such it is an objective reality. Perception as a dynamic pattern is the point of departure for the Gestalt-school : such a pattern is "a self-completing, objective event, the subjective aspects of which have significance only in so far as they describe its objective nature."

Other matters of interest in the volume are: M. C. Barlow : A Learning Curve Equation as fitted to Learning Records. Max Schoen : Instinct and Intelligence.

N. N. SENGUPTA

The Journal of Abnormal and Social Psychology,
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*Why has Psychology failed to make greater contributions
to Law ?*

Psychology may be of help to courts of law in three different ways : (1) it may establish the mental condition of the criminal ; (2) it may determine the accuracy of testimony ; (3) it may help in the detection of guilt. In the

first case, it has been usual for the psychologist to draw a picture of the normal mind and to indicate the factors which disturb the balance of mind. The factors are sufficiently numerous to cover all cases; disease, heredity, drugs, depressing moods, worry, fatigue are some of the conditions. The alienist then shows that the perverted mind is capable of crimes. "The individual criminal is not diagnosed as an individual but rather as a composite of criminals or as a hypothetical average criminal." In the second instance, too, the psychologist has been able to add but little to what is done by lawyer's cross examination. It is not possible to determine an individual's percentage of testimonial accuracy nor is it possible to say whether the evidence would be correct on crucial points or in matters of detail. In the matter of detection of guilt, the methods pursued are the familiar third degree and the associative reactions. The first procedure is undoubtedly one which no psychologist would advocate. The second method is vitiated by the fact that variations from the normal reaction time may be accounted for in more ways than one. It is for these reasons that psychology has failed to be of service in law courts.

Deception and Self-deception :
H. M. Adler and J. A. Larson.

The experiments reported in this paper contradict the position taken in the previous essay. The authors have studied the cardiac, respiratory and blood-pressure symptoms of deception and have tried to show that attempts at deceiving others can very often be detected from the physical changes. The same procedure enables the authors to conclude that hallucinatory ideas are believed by the subjects to be real. For, in such case, the physical changes correspond to the hallucinatory experiences. In the cases of psycho-neurosis, the delusional ideas seem to lack in the firmness of conviction. The

authors state that the last generalisation is not yet justified on account of the limited character of the data.

The Nature of Hypnosis : as indicated by the presence or absence of Post-hypnotic Amnesia and Rapport :
P. C. Young.

MacDougall states that all so-called auto-suggestion is in reality hetero-suggestion. Ferenczi and Baudouin, on the other hand, say that there is no suggestion but only auto-suggestion. The two main sets of characteristics of hypnosis, (1) a state abstraction reverie or somnambulism and (2) the condition of *rapport*, may help us to settle the claims of the rival hypothesis.

The author finds that in the case of some of the subjects, the post-hypnotic amnesia and rapport could be modified or eliminated without destroying the hypnotic state. He is also of opinion that post-hypnotic amnesia depends upon the explicit or tacit auto-suggestion of the subject. When the suggestion of the hypnotist is at variance with the deep-seated convictions of the subject, the latter prevail. The author concludes that the essential element in hypnosis is auto-suggestion rather than hetero-suggestion. Hetero-suggestion is effective in so far as the subject comes to believe that what the hypnotist says would take place.

A Study of Basic Tendencies :
G. W. Howland.

Basal tendencies are activities which so predominate in normal individuals that they are found to determine the course in life that these persons follow. The number of these is comparatively few. The basal tendencies were investigated by the author with the help of a single question which was presented to 70 medical students in the prefinal year and to 50 second year nurses who were all matriculates.

The question presented was "what would you do in case you were left a sum of 200,000 dollars by a relative." The author tabulates the answer and ascribes them to certain desires such as acquisition, movement, home, etc. It is interesting to note that the desire for movement is about 30% in the case of males and 52% in the case of females while that for home is 3% in the case of males and 20% in the case of females. The males show a tendency to acquisition to the extent of 45% while females to the extent of 80%.

Consistency and the Concept of Instinct :
D. M. Trout.

The author points out that the mechanistic concept of causality as it obtains in physics, is inadequate for psychology. This view finds its expression in the theory of earlier biology that the characteristics of the complex organism are predetermined in its elementary cells or other simpler determinants out of which it develops. The epigenetic theory which maintains that differentiation to form the various characteristics of the organism results from the interrelation and interaction of primary cells and of the complex organism with the environment, is more in keeping with facts. The paper proceeds to apply the epigenetic concept to behaviour and concludes that the traditional terms such as reflex, instinct, etc., should be replaced by other concepts. He suggests the term *reaction* for reflex, habit, etc., *response* for deliberative behaviour and *interaction* for behaviour to animals and social objects.

*Introspective Method and the Theory of Primary
and Derived Emotions :*
C. O. Weber.

The paper presents the data of a questionnaire study of the problem of simplicity and complexity of emotions. The results are correlated with Intelligence test scores and the

author concludes that "the more intelligent students had more success in arriving at MacDougall's analysis. It is further found that MacDougall's analysis is almost wholly independent of individual peculiarities of association, emotion and temperament" as measured by the best available tests. Other articles of interest in the volume are Thurstone's *Measurement of Opinion*, Young's, *the Measurement of Personal and Social Traits*, and Malmud's *Poetry and Emotions (1) a dilemma for critics, (2) experimental verification*.

N. N. SENGUPTA

Psychological Monographs, Vol. XXXVII, No. 3.

Individual Differences in Imagery :
Charles H. Griffiths.

Since Galton's time when scientific interest in the imagery was first stimulated, many workers have investigated the question of individual differences in imagery in its various aspects. Personal peculiarities in visual imagery, its frequency of occurrence, as well as the existence of non-visual images, have been the usual problems of research in this field. The early investigators believed in the existence of distinct types of individuals with respect to imagery, but recent discoveries have led to the rejection of the 'pure-type' notion. The author of the paper has attempted in this work a thorough investigation into the nature and extent of individual differences in imagery. A set of seven tests for bringing out the different aspects of imagery has been devised, and experiments have been carried on with the help of 112 subjects. The tests are for (1) Clearness of concrete imagery, (2) Capacity of visualization, (3) Fluctuation of clearness, (4) Dominance of concrete

imagery, (5) Dominance of verbal imagery, (6) Backward repetition, (7) Memory. The result, though showing the presence of great individual differences, furnishes no evidence of the existence of either "simple types" or "combination types." The dominance of visual imagery is markedly manifest. There is a slight indication that visual imagery tends to stand alone and that auditory and kinaesthetic images tend to go together. The author objects to the use of the term 'imagery type' as misleading and confusing. In his opinion, "any adequate description of an individual's imagery must include separate statements regarding the quantitative and qualitative aspects of concrete imagery, and the same for verbal imagery; and based on both inter-individual and intra-individual comparisons."

The paper supplies valuable information on topics like relation between clearness and dominance, relation between concrete and verbal imagery, sex differences with respect to imagery, and imageless thought.

S. K. BOSE

Wilhelm Stekel

The 18th March of 1928 will be the sixtieth anniversary of the birth of the eminent Viennese psychiatrist, Dr. Wilhelm Stekel. The name of Stekel was at one time almost of the same rank as that of Freud himself. The publication in 1908 of Stekel's "Nervöse Angstzustände und deren Behandlungen" marked an epoch in modern psychotherapy. It was Stekel who first recognised the nosological identity of the anxiety states and this discovery led to his alliance with the founders of the psychoanalytical school of psychology, for Stekel was quick to realise how much illumination psychoanalysis could throw upon the trail he had started to blaze.

One result of this alliance was Stekel's appointment to the editorial staff of the Zentralblatt für Psychoanalyse. It is probably more a matter for regret than for surprise that Stekel did not continue long to remain within the fold of psychoanalysis. Nevertheless, psychiatrists and psychopathologists the world over will join in wishing the distinguished veteran many more years in which to enjoy the life of which he has made so cultured a study and to the understanding of which he has aided so much. For Stekel is not only a physician eminent in his own speciality but a man of wide reading and broad outlook; a cosmopolitan in the best sense of the term and last but by no means the least, an accomplished musician.

O. BERKELEY HILL
